

CLAIMS

1. A guide-wetting fall polymerizer device for producing an aromatic polycarbonate from a molten aromatic polycarbonate prepolymer at a rate of 1 t/hr or more,
5 said molten prepolymer being obtained by reacting an aromatic dihydroxy compound with a diaryl carbonate, which comprises:

a casing having an inlet for a molten aromatic polycarbonate prepolymer, a molten aromatic polycarbonate prepolymer feeding zone positioned subsequent to
10 and communicating with said inlet, a polymerization reaction zone positioned subsequent to and communicating with said molten prepolymer feeding zone, and an outlet, for an aromatic polycarbonate, positioned subsequent to
15 and communicating with said polymerization reaction zone,

an evacuation device provided in association with said polymerization reaction zone of said casing, and

a withdrawal device provided in association with
20 said outlet of said casing,

said polymerization reaction zone having a space which has a guide securely held therein and extending downwardly therethrough,

said polymerization reaction zone being separated
25 from said molten prepolymer feeding zone through a dis-

tribution plate having a plurality of holes, through which said molten prepolymer feeding zone communicates with said polymerization reaction zone,

wherein, when a molten aromatic polycarbonate prepolymer is introduced into said polymerization reaction zone, said molten prepolymer falls along and in contact with the surface of said guide in said polymerization reaction zone, thereby effecting polymerization of said molten prepolymer to produce an aromatic polycarbonate,

wherein said casing in said guide-wetting fall polymerizer device has, at its polymerization reaction zone, an upper portion defined by an upper peripheral side wall and a lower tapered portion defined by a lower peripheral wall which is inclined toward said outlet and continuously extends downwardly from said upper peripheral side wall, said lower tapered portion having said outlet at the bottom thereof, so that, when the produced aromatic polycarbonate falling off from said guide gets in contact with an inner surface of said lower peripheral wall of said lower tapered portion, the aromatic polycarbonate flows down on the inner surface of said lower peripheral wall to said outlet,

wherein said guide-wetting fall polymerizer device has the following characteristics (1) to (5):

(1) the opening area (A) (m^2) of the horizontal cross section of said upper portion of said casing satisfies the following formula:

$$0.7 \leq A \leq 200;$$

5 (2) said guide-wetting fall polymerizer device satisfies the following formula:

$$20 \leq A/B \leq 1,000$$

wherein A is as defined above for said characteristic (1) and B represents a
10 minimum opening area (m^2) of the cross section of said outlet;

(3) the angle (C) ($^\circ$) between said upper peripheral side wall of said upper portion and the inner surface of said lower peripheral wall of the lower tapered
15 portion, as measured with respect to a vertical cross section of said casing, satisfies the following formula:

$$120 \leq C \leq 165;$$

(4) the length (h) (cm) of said guide satisfies
20 the following formula:

$$150 \leq h \leq 3,000; \text{ and}$$

(5) the total outer surface area (S1) (m^2) of said guide satisfies the following formula:

$$2 \leq S1 \leq 5,000.$$

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2. The polymerizer device according to claim 1,
wherein said upper portion of said casing is cylindri-
cal, said lower tapered portion of said casing is re-
verse conical, and said outlet is cylindrical, wherein
5 the inner diameter (D) (cm) of said upper portion, the
length (L) (cm) of said upper portion, the inner diame-
ter (d) (cm) of said outlet and said length (h) (cm) of
said guide satisfy the following formulae:

$$100 \leq D \leq 1,000,$$

10 $5 \leq D/d \leq 50,$

$$0.5 \leq L/D \leq 30, \text{ and}$$

$$h - 20 \leq L \leq h + 300.$$

3. The polymerizer device according to claim 1 or 2,
15 wherein said guide is columnar, and the diameter (r)
(cm) of said guide satisfies the following formula:

$$0.1 \leq r \leq 1.$$

4. The polymerizer device according to claim 1 or 2,
20 wherein said guide comprises a plurality of columnar
subguides extending downwardly, each of which independ-
ently has a diameter (r) (cm) which satisfies the fol-
lowing formula:

$$0.1 \leq r \leq 1,$$

25 said plurality of columnar subguides being se-

curely held by means of at least one supporting rod
crossing said columnar subguides.

5. The polymerizer device according to claim 4,
5 wherein said guide is in the form of at least one net,
or a jungle gym-like three-dimensional structure,
wherein, when said guide is in the form of a plurality
of nets, the nets are securely arranged substantially
in parallel.

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6. The polymerizer device according to any one of
claims 1 to 5, wherein said casing has a vacuum vent
through which said evacuation device communicates with
said polymerization reaction zone, and wherein each of
15 said casing, said distribution plate, said guide, said
vacuum vent, and said outlet is made of stainless steel.

7. The polymerizer device according to any one of
claims 1 to 6, which has connected thereto at least one
20 additional guide-wetting fall polymerizer device which
has said characteristics (1) to (5), with the proviso
that when a plurality of additional guide-wetting fall
polymerizer devices are used, the polymerizer devices
are connected in series.

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8. The polymerizer device according to claim 7, which has one additional guide-wetting fall polymerizer device connected thereto, and wherein said total outer surface area (S1) (m²) of the guide used in said guide
5 -wetting fall polymerizer device and the total outer surface area (S2) (m²) of the guide used in said additional guide-wetting fall polymerizer device satisfy the following formula:

$$1 \leq S1/S2 \leq 20.$$

10 9. The polymerizer device according to any one of claims 1 to 6, which is provided with an inert gas absorption device for causing a molten aromatic polycarbonate prepolymer to absorb an inert gas prior to feed-
15 ing of the molten prepolymer into said polymerizer device.

20 10. The polymerizer device according to claim 7 or 8, wherein each of said polymerizer device and said further polymerizer device is provided with an inert gas absorption device for causing a molten aromatic polycarbonate prepolymer to absorb an inert gas prior to feeding of the molten prepolymer into said polymerizer device or further polymerizer device.